

REMARKS/ARGUMENTS

Claims 2-8 are in the application. Claim 8 is independent. The remaining claims depend from claim 8.

Claim 8 has been rejected under 35 U.S.C. §103(a) over Huang in view of Lidow. This rejection is identical to the one asserted against claim 1 (now cancelled) in the Office Action dated September 27, 2002. In a response submitted on December 27, 2002, it was argued that Huang does not show lateral invertible channels. In paragraph 5 of the Office Action, the Examiner has stated that "invertible is defined as capable of being inverted and inverted is defined as to turn inside out or upside down. Therefore, since the channel region is invertible it means that it can be turned upside down in a vertical direction."

Invertible in the art of MOSgated devices means a region of one conductivity type which can be turned into a region of another conductivity type through inversion. Inversion as is well known in the art occurs upon application of an electric field through for example a gate structure. It is respectfully submitted that a person skilled in the art would not read invertible channel as a channel that can be physically "turned upside down in a vertical direction." Indeed, such is impossible in that channel regions are not capable of physical movement within the device.

The arguments set forth in the response of December 27, 2002 were meant to point out that Huang teaches a device with vertically oriented channel regions. On the other hand, claim 8 is directed at a planar device which include laterally extending channel regions. The teachings of Huang including the dimensions disclosed therein for source regions and the channel region do not apply to planar devices. In planar devices, the depth of the source region contained within the channel region has a bearing on the characteristics of the device. Most notable of such characteristics is the ability of the device to withstand punch through. As explained in the background of the application when the source region is made too deep the distance between its outer boundary and the junction between the body in which the source region is contained, and the drain region in which the body region is contained (the distance being designated as X in Figure 1) has a direct effect on the ability of the device to withstand punch through during reverse bias conditions. Thus, to increase the distance between the outer boundary of source regions and the junction between the body region and the drain (distance X, Figure 1), the thermal treatment step during the processing of conventional devices is limited to prevent the outer boundary of the source regions from approaching the junction of the body region and the

drain region. As a result of a limited thermal step, the source regions do not advance deeper within the body regions in which they are contained, and more importantly do not advance laterally either. Thus, in prior art devices there was a limitation on how short the channel could be made in order to improve the capability of the device to withstand punch through. Of course, the longer the channel, the higher such characteristics as V_{th} and R_{dson} (ON resistance).

According to the present invention, the source regions are made extremely shallow (less than 0.3 microns as called for by claim 8). As a result punch through can be limited. See specification, page 6, paragraph 22. There is no disclosure in Huang or any other cited reference, which teaches or suggests making the source regions in a planar device of such dimensions in order to improve the ability of the device to withstand punch through. Accordingly, it is respectfully submitted that the subject matter of claim 8 is not obvious over Huang in view of Lidow. Reconsideration is requested.

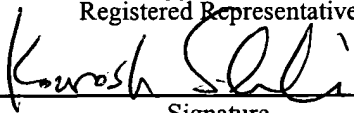
Each of the remaining claims depends from claim 8, and, therefore, includes its limitations. Each of these claims includes other limitations which in combination with those of claim 8 are not shown or suggested by the art of record. Reconsideration is requested.

The application is believed to be condition for allowance. Such action is earnestly solicited.

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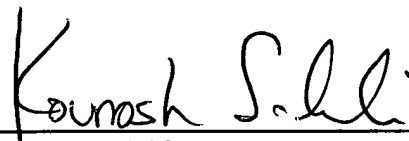
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Respectfully submitted,



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